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RECENT LITERATURE

Bresslau, Ernst. **THE MAMMARY APPARATUS OF THE MAMMALIA IN THE LIGHT OF ONTOGENESIS AND PHYLOGENESIS.** WITH A NOTE BY J. P. HILL. London: Methuen & Co. Pp. i-vii, 1-145, with 47 illustrations. 1920.

This splendid book is a résumé of the author's extensive investigations on the development of the milk-glands and related structures in mammals and on the evolutionary history of the mammary apparatus. The subject is divided into three chapters describing the development of the mammary organs in the three principal groups of mammals, Monotremata, Marsupialia, and Placentalia.

The development of the mammary apparatus does not begin with the arrangements for the accommodation of the young, i.e. with the formation of the pouch, but much earlier, with structures which the author terms primary-primordia, that is, gland areas. These are followed in *Echidna* by the development of the incubatorium and at last by mammary glands. The gland areas act as a hindrance to the extension of the developing panniculus carnosus muscle immediately after birth. Thus there remains an oval, muscle-free area on the ventral side of the trunk which later develops into the incubatorium. In *Ornithorhynchus* the incubatorium is absent, most likely an adaptive feature in this aquatic animal. The marsupium or pouch in marsupials is in no way to be compared with the incubatorium of *Echidna*. It arises as the result of developmental processes in the epidermis which lead to the formation of so-called marsupial pockets, which are entirely unrepresented in *Echidna*. The great apparent similarity of incubatorium and marsupium in the adult animals rests solely on convergence. Among the Didelphyidae there are many pouchless forms in which a marsupium never existed. No pouch rudiments can be found in the Placentalia, since a pouch stage is not included in the phylogeny of this group.

The original nipple is represented by the simple type of eversion nipple which forms the common point of departure for the evolution of the marsupial as well as of the placental nipples. This type arises from the nipple pouches, discovered by Morgan, the final nipple appearing through eversion of the pouch. Another type, the so-called proliferation nipple, is formed through the involution of the nipple pouch stage. Here the nipple wall is formed essentially by the cutis, the apical portion only by the original primordia; whereas in the first mentioned type of nipple almost the entire epithelial covering is furnished by the original primordia. The so-called milk-streaks of placental embryos are homologous to the primary-primordia of monotremes and marsupials. From these milk-streaks spring the nipples and milk-glands of the Placentalia and their development is much like that in marsupials.

The interesting discussions on the number and arrangement of nipples in marsupials, on the specializations of this organ in placentals, on the mammary hairs, and other related questions do not lend themselves for further condensation in this review. It is to be regretted that some of the illustrations are not better reproduced.

—A. H. Schultz.

Michelsson, G. **DIE HAUTMUSKULATUR DES IGELS (ERINACEUS EUROPAEUS).** Morphol. Jahrb., vol. 51, pp. 147-229. 1921.

A careful, detailed description of the cutaneous musculature of the hedgehog, *Erinaceus europaeus*, and a comparison of these muscles with related structures in

other mammals. Thirty-five specimens of the hedgehog were dissected and some interesting variations in the cutaneous musculature were found. The author concludes that the facial musculature in particular represents a mixture of primitive conditions, resembling those found in *Echidna*, and those existing in much higher forms. The large orbicularis muscle is restricted to the hedgehog, but seems to have developed from the *musculus humero-dorsalis*, which has a very wide distribution among mammals. All the facial and cervical musculature is supplied from the *nervus facialis*, and all the trunk musculature, except the *musculus dorso-cuticularis*, from the anterior thoracic nerve.

—A. H. Schultz.

ACKERKNECHT, EBERHARDT. Über den Begriff und das Vorkommen der Spatien im Säugetierkörper. *Anat. Anz.*, vol. 54, pp. 465-490. November 30, 1921.

ANDREWS, C. W. Note on a bear (*Ursus savini*, sp. n.) from the Cromer Forest-bed. *Ann. and Mag. Nat. Hist.*, ser. 9, vol. 9, pp. 204-207. February, 1922.

ANTHONY, H. E. From humid forest to snow-capped height in Ecuador. *Nat. Hist.*, vol. 21, pp. 459-473; 13 figs. September-October, 1921. (Contains many notes on mammals.)

— Mammals collected by William Beebe at the British Guiana Tropical Research Station. *Zoologica*, vol. 3, no. 13, pp. 265-285; 2 pls. December 24, 1921. (Lists 56 species from the station, and 4 additional forms from Georgetown. An appendix by Beebe lists species seen but not collected and preserved, and brings the total number at the station to 70.)

BAKER, FRANK COLLINS. The importance of ecology in the interpretation of fossil faunas. *Ecology*, vol. 2, pp. 277-280. October, 1921 (January, 20, 1922).

BAKER, F. S., C. F. KORSTIAN, AND N. J. FETHEROLF. Snowshoe rabbits and conifers in the Wasatch Mountains of Utah. *Ecology*, vol. 2, pp. 304-310. October, 1921 (January 20, 1922).

BLAINE, GILBERT. Three new races of *Cephalophus monticola*. *Ann. and Mag. Nat. Hist.*, ser. 9, vol. 9, pp. 174-176. February, 1922. (New subspecies from Rhodesia and Zululand.)

CHAPMAN, FRANK M. A life of abundant accomplishment. *Nat. Hist.*, vol. 21, pp. 515-519. September-October, 1921. (Sketch of the life and work of Dr. J. A. Allen, 1838-1921.)

EVERMANN, BARTON WARREN. Fur seals off the Farallones. *Science*, n. s., vol. 54, pp. 547-548. December 2, 1921.

FERNANDEZ, MIGUEL. Schuppe, Haar und Haarscheibe der Säugetiere. *Anat. Anz.*, vol. 54, pp. 506-526, 1 pl. December 12, 1921.

FLOWER, S. S. Report on the Zoological Service for the year 1920 in which is included the 22nd annual report of the Giza Zoological Gardens. Ministry of Public Works, Egypt, Zool. Service, Pub. no. 34, pp. 1-20. Cairo, 1921. (On October 6, 1920, the Giza gardens contained 328 mammals of 87 forms.)

GRINNELL, JOSEPH. Two new rodents (genera *Thomomys* and *Marmota*) from the eastern border of California. *Univ. California Pub. Zool.*, vol. 21, pp. 239-244, 6 figs. November 7, 1921. (Describes *Thomomys perpallidus amargosae*, Shoshone, Inyo County, California; and *Marmota flaviventris fortirostris*, White Mountains, Mono County, California.)

GRINNELL, JOSEPH, AND TRACY IRWIN STORER. Some mammals of Yosemite National Park. Hall's Handbook of Yosemite National Park, G. P. Putnam's Sons, pp. 155-173, 4 pls. 1921.

GROTE, HERMANN. Neue Erdferkel (*Orycteropus*) aus Deutsch-Ostafrika und Kamerun. Archiv f. Nat., 87 Jahrg., Abt. A, Heft 7, pp. 121-127. 1921. (Describes five new subspecies of *Orycteropus afer*.)

HAAGNER, A. K. A guide to the National Zoological Gardens of South Africa. Pp. 1-54, many illustr. Pretoria. October, 1921.

HAY, OLIVER P. Descriptions of some Pleistocene vertebrates found in the United States. Proc. U. S. Nat. Mus., vol. 58, pp. 83-146, pls. 3-11. October 12, 1920.

HIRSCH, MAX. Der Lückzahn von *Sus domesticus*, ein Beitrag zur Entwicklungsgeschichte des Gebisses von *Sus domesticus* und zur Kenntnis des Wesens der Dentitionen. Anat. Anz., vol. 54, pp. 323-330. October, 1921.

HOLLISTER, N. Report of the superintendent of the National Zoological Park for the fiscal year ending June 30, 1921. Ann. Rep. Smithsonian Inst., 1921, pp. 84-99. December, 1921.

INTERNATIONAL COMMISSION ON ZOOLOGICAL NOMENCLATURE. Opinions rendered by the International Commission on Zoological Nomenclature. Opinions 68 to 77. Smithsonian Misc. Coll., vol. 73, no. 1, pp. 1-73. January 31, 1922.

JACOBSON, E. Notes on some mammals from Sumatra. Journ. Fed. Malay States Mus., vol. 10, pt. 3, pp. 235-240. 1921. (Interesting notes on the hare, tiger, leopard, and other species.)

JENKINS, J. TRAVIS. A history of the whale fisheries. Pp. 1-336, 12 pls. London: H. F. and G. Witherby. 1921.

KHALIL, M. A preliminary note on some new nematode parasites from the elephant. Ann. and Mag. Nat. Hist., ser. 9, vol. 9, pp. 212-216. February, 1922.

KLOSS, C. BODEN. Seven new Malaysian mammals. Journ. Fed. Malay States Mus., vol. 10, pt. 3, pp. 229-234. 1921. (New forms of *Balionycteris*, *Petaurusista*, *Sciurus*, *Lariscus*, and *Rattus*.)

KLUGH, A. BROOKER. A correction concerning the life zones of Canada. Biol. Bull., vol. 41, pp. 272-275. November, 1921 (January, 1922). (Extends Transition Zone northward in Ontario to mouth of Shawanaga River, including Bruce Peninsula therein.)

KRIEG, HANS. Über Pigmentzentren bei Säugetieren. Anat. Anz., vol. 54, pp. 353-365. October 15, 1921.

MERRIAM, C. HART. A California elk drive. Sci. Monthly, pp. 466-475. November, 1921.

MERRIAM, JOHN C., AND CHESTER STOCK. Occurrence of Pleistocene vertebrates in an asphalt deposit near McKittrick, California. Science, n. s., vol. 54, pp. 566-567. December 9, 1921.

MOULTON, J. C. Occurrence of the Malayan badger or teledu in Borneo. Journ. Straits Branch, Royal Asiatic Soc., no. 83, pp. 142-146. April, 1921. (New: *Mydaus javanensis montanus* from northern Sarawak, Borneo.)

NELSON, E. W. Report of chief of Bureau of Biological Survey. Washington. Pp. 1-34. 1921.

NIELSEN, AAGE KRARUP. En Hvalfangerfærd gennem Troperne til Sydshavet. Copenhagen: H. Aschehoug & Co. 160 pp. 1921. (A profusely illustrated account of a voyage from Norway to the whaling grounds in the South Shetland Islands.)

OBERHOLSER, HARRY C. Notes on Horsfield's "Zoological Researches in Java." Proc. Biol. Soc. Washington, vol. 34, pp. 163-166. December 21, 1921.

OSBORN, HENRY FAIRFIELD. Joel Asaph Allen, 1838-1921. An appreciation. Nat. Hist., vol. 21, pp. 513-515, portrait. September-October, 1921.

— The evolution, phylogeny, and classification of the Mastodontidae. Bull. Geol. Soc. Amer., vol. 32, pp. 327-332. September 1 (October 5), 1921.

— Adaptive radiation and classification of the Proboscidea. Proc. Nat. Acad. Sci., vol. 7, no. 8, pp. 231-234. August (December 19), 1921.

ROBINSON, HERBERT C., AND C. BODEN KLOSS. New mammals from French Indo-China and Siam. Ann. and Mag. Nat. Hist., ser. 9, vol. 9, pp. 87-99. January, 1922. (Describes new forms of *Tupaia*, *Crocidura*, *Ratufa*, *Callosciurus*, *Tamiops*, *Rattus*, and *Taftatus*.)

SCHULTZ, ADOLPH H. Fetuses of the Guiana howling monkey. Zoologica, vol. 3, no. 12, pp. 243-262, 6 figs. December 24, 1921.

SCHUMACHER, SIEGMUND. Darmzotten und Darmdrüsen bei den Waldhühnern. Anat. Anz., vol. 54, pp. 373-381. October, 1921.

SHAW, WILLIAM T. Moisture and altitude as factors in determining the seasonal activities of the Townsend ground squirrel in Washington. Ecology, vol. 2, pp. 189-192. July, 1921.

SHUFELDT, R. W. Skeletons of the monotremes in the collection of the Army Medical Museum at Washington. Royal Soc. Tasmania, Papers and Proc., 1921, pp. 99-110, 5 pls. October 28, 1921. (Describes skeletons of *Ornithorhynchus* and *Echidna*.)

— How skunks defend themselves. Amer. Forestry., vol. 28, pp. 26-29, 41, 10 figs. January, 1922. (Popular account of North American Mustelidae.)

— Badgers and wolverenes. Amer. Forestry, vol. 28, pp. 105-112, 8 figs. February, 1922. (Popular account of the American forms.)

SUMNER, F. B. The responsibility of the biologist in the matter of preserving natural conditions. Science, n. s., vol. 54, pp. 39-43. July 15, 1921.

THOMAS, OLDFIELD. On a further collection of mammals from Jujuy obtained by Sr. E. Budin. Ann. and Mag. Nat. Hist., ser. 9, vol. 8, pp. 608-617. December, 1921. (New forms: *Sciurus argentinus*, *Phyllotis nogalaris*, *Neotomys vulturinus*, *Hypsomys deceptor*, and *Oxymycterus akodontius*.)

— The masked civets (*Paguma*) of western China. Ann. and Mag. Nat. Hist., ser. 9, vol. 8, pp. 617-618. December, 1921. (New: *Paguma larvata yunalis* and *P. l. rivalis*.)

— On three new Australian rats. Ann. and Mag. Nat. Hist., ser. 9, vol. 8, pp. 618-622. December, 1921. (New: *Leporillus jonesi*, *Rattus villosissimus profusus*, and *Pseudomys australis oralis*.)

— New *Hesperomys* and *Galea* from Bolivia. Ann. and Mag. Nat. Hist., ser. 9, vol. 8, pp. 622-624. December, 1921.

— Two new species of slow-loris. Ann. and Mag. Nat. Hist., ser. 9, vol. 8, pp. 627-628. December, 1921. (Describes two new species of *Nycticebus*.)

THOMAS, OLDFIELD. On some interesting hedgehogs from the Persian Gulf. Ann. and Mag. Nat. Hist., ser. 9, vol. 9, pp. 142-144. January, 1922. (Three new forms of *Paraechinus*.)

— On some new forms of Ochotona. Ann. and Mag. Nat. Hist., ser. 9, vol. 9, pp. 187-193. February, 1922. (Describes 6 new species and subspecies from central Asia.)

— Some notes on ferret-badgers. Ann. and Mag. Nat. Hist., ser. 9, vol. 9, pp. 193-196. February, 1922. (New forms of *Melogale* and *Helictis*.)

— On the systematic arrangement of the marmosets. Ann. and Mag. Nat. Hist., ser. 9, vol. 9, pp. 196-199. February, 1922. (One new species: *Mico leucippe* from lower Amazon.)

THOMAS, OLDFIELD, AND MARTIN A. C. HINTON. The Mammals of the 1921 Mount Everest Expedition. Ann. and Mag. Nat. Hist., ser. 9, vol. 9, pp. 178-186. February, 1922. (Pikas were seen at an altitude of 20,100 feet. New species of *Cricetulus*, *Phaiomys*, and *Ochotona*.)

TROUESSART, E.-L. La Distribution Géographique des Animaux. Pp. 1-332; i-xii; 14 figs., maps. Gaston Doin, Paris, 12fr. 1922. (A volume of the Encyclopédie Scientifique, Bibliothèque de Zoologie.)

WALKER, ALEX. Some notes on the preparation of mammal skins. Oologist, vol. 38, pp. 166-170. December, 1921.

ZUKOWSKY, LUDWIG. Mitteilungen über eine anscheinend neue Form von *Hylochoerus* aus dem Winterhochlande, vom Mutjekgebirge und vom Meru-Berge. Archiv f. Nat., 87 Jahrg., Abt. A, Heft 1, pp. 179-191; 1 fig. July, 1921. (*Hylochoerus schulzi*, sp. nov.)

— Wissenschaftliche Bemerkungen über das Wild des Kaokofeldes unter Berücksichtigung der Aufzeichnungen und der Sammlung des Herrn Hauptmann a. D. Steinhardt. Reprint from Steinhardt's "Vom wehrhaften Riesen und seinem Reiche," ed. 2; separates paged 1-15. October 1, 1921. (New species: *Opsiceros occidentalis*.)

CORRESPONDENCE

THE ZOOLOGICAL RECORD

The Editor, Journal of Mammalogy:

I should be glad if you would draw the attention of your readers to the present position of the Zoological Record.

Owing to the collapse of the International Catalogue of Scientific Literature, in connection with which the Record was published from 1906 to 1914, the Zoological Society of London has undertaken to bear the whole financial responsibility for the preparation and printing of the Record.

Owing to the great increase of the cost of printing and to the very meagre support accorded to the Record by zoologists and zoological institutes generally, the financial burden of this undertaking on the Zoological Society is becoming very severe. The cost of printing the Record now amounts to between £1500 and £2000 annually and the Society receives back by subscribers and sales less than 25 per cent of this sum; I fear, therefore, unless zoologists are prepared to make greater efforts to support the undertaking, there is a strong possibility that the Council of the Zoological Society may refuse to find this large sum each year.